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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/688,584	10/17/2003	William Hein	PH020/003	2262

7590 04/20/2006

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EXAMINER	
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ART UNIT	PAPER NUMBER
3742	

DATE MAILED: 04/20/2006

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/688,584
Filing Date: October 17, 2003
Appellant(s): HEIN ET AL.

Gene R. Woodle
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 2-9-2006 appealing from the Office action mailed 11-23-2005.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

4,003,554	CHAUFFOUREAUX	1-1977
4,640,020	WEAR ET AL	2-1987
4,326,114	GERLING ET AL	4-1982

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chauffoureaux (US 4,003,554), in view of Wear et al (US 4,640,020).

Chauffoureaux shows a microwave heating device including (1) a loading section 5' into which the material may be introduced using loading means; (2) a treatment section 1' which is in communication with the loading section 5'; (3) an unloading section (the end portion of waveguide 1' at holes 13') which is in communication with the treatment section; (4) a reciprocating ram 17 within said loading section which is capable of pushing the material from said loading section into said treatment section and through said treatment section into said unloading section; (5) a microwave guide connecting a microwave generator 2' into the material

within said treatment section 1', and (6) unloading means (after the outlet of die 16) the die capable of removing the material from said unloading section; whereby material may be loaded into said loading section and pushed into said treatment section; the material treated by microwaves within said treatment section and the material removed from said unloading section by unloading means" (see Figure 2 and col. 2, lines 55-64 and col. 5, lines 10-65). To use the microwave heating device for drying" would be matter of engineering variation depending on what type of material being heat-treated by the microwave.

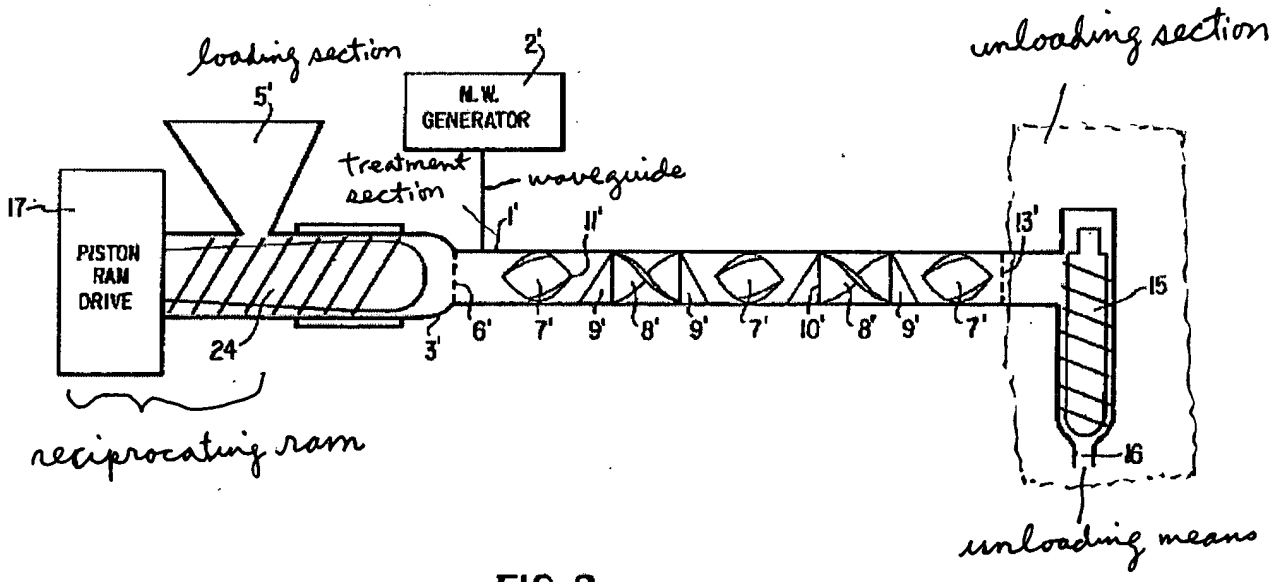

FIG. 2

Therefore, Chauffoureaux shows every feature and structure as claimed except for the use of a plurality of waveguides for directing microwaves from the microwave generator into the treatment section. Wear shows that it is well known in the art of conveyorized microwave dryer to use a plurality of microwave feed ports for directing microwave into the microwave treatment section to control the drying process. The feed ports routinely include a plurality of wave guides 116, 126, 132 connected to generators, 114, 124, 130 to radiating ports 118, 128, 134 for

distributing microwave around the treatment section (see Figure 1 and col. 8, lines 24-54 and col. 9, line 39 – col. 10, line 34). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Chauffoureaux to use a plurality of microwave guides each connected to a microwave generator for distributing microwave along the treatment section for better heating control, in view of the teaching of Wear. In regard to claim 2, the limitation "outside air is introduced ..... from the microwave dryer" is only a statement of intended function without any positive structure in the claimed dryer. Anyway, Wear also teaches the use of a purge gas passing over the product to carry away the vapor (see the abstract, last 5 lines and col. 11, line 34 – col. 12, line 18).

Claims 3-6, 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chauffoureaux (US 4,003,554) and Wear et al (US 4,640,020), as applied to claims 1 and 2 above, and further in view of Gerling et al (US 4,326,114) (previously cited).

As set forth above, Chauffoureaux combined with Wear shows every feature as claimed except for "the treatment section may be tilted" in claims 3, 6, 8 and 9 and the sections are modular claimed in claims 4 and 9. Again, the limitation "may be tilted" is only a statement of intended function without any positive structure in the claimed dryer. However, Gerling shows a microwave roasting device for heating, drying and/or roasting materials (see col. 6, lines 44-47 and col. 10, lines 2-4) including (1) a loading section 52 into which the material may be introduced using loading means; (2) a treatment section 20 which is in communication with the loading section; (3) an unloading section 60 which is in communication with the treatment section;(4) a hopper 72 with a screw-feed mechanism within said loading section which is

capable of pushing the material from said loading section into said treatment section and through said treatment section into said unloading section; (5) a plurality of microwave generator 64-1, 64-2, 64-3, 64-4 into the material within said treatment section, and (6) unloading means capable of removing the material from said unloading section; whereby material may be loaded into said loading section and pushed into said treatment section; the material treated by microwaves within said treatment section and the material removed from said unloading section by unloading means" (see Figures 1 and 2 and col. 5, line 24 – col. 7, line 43). Furthermore, Gerling shows the use of a tilted tube to increase or decrease the flow rate of material through said treatment section as claimed. To tilt only the tube 90 which may be considered as the treatment zone by itself or the entire treatment zone 20 would have been a matter of engineering expediency as long as the claimed intended function "to increase or decrease the flow rate of material through said treatment section" is met. In regard to claims 4 and 9, Gerling also shows the use of a modular construction to permit scale up or scale down such that the length of the microwave dryer may be adjusted to suit production requirement (see col. 9, lines 47-51). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Chauffoureaux combined with Wear to tilt the treatment zone to control the feed speed and to use a modular construction to permit easy adjustment of the heating device, in view of the teaching of Gerling.

(10) Response to Argument

As set forth, above, Chauffoureaux clearly shows a microwave heating device including substantially all the claimed features except for the use of a plurality of microwave guides. The argument that the use Chauffoureaux as prior art is inappropriate is not well taken. It is respectfully submitted that the claims are directed to a microwave dryer NOT a drying method. The claimed microwave dryer is just a microwave heating device as it includes no exclusive feature that is specific only to drying. Therefore, the load to be treated by the microwave heating device is a mere intended use and adds little patentable weight to the claimed structure as long as the prior art has the same ability to carry out the same function. In this case, Chauffoureaux clearly can perform the same function as the material in the treatment waveguide 1 can be heated and dried by the microwave from the generator 2. Clearly, any heating also inherently causes a drying function of the material. One of ordinary skill in the art would consider Chauffoureaux as a pertinent reference as it is a microwave heating device for continuously heat-treating a material passing through a treatment section. That is what the basic claimed invention is all about.

In regard to the argument relating to the device 24 in Chauffoureaux, it is respectfully submitted that the term "the piston ram drive 17" logically suggests to an ordinary artisan that it drives a piston (the device 24, it is believed "position 24" at col. 5, line 54 is an obvious typographical error and was intended to be "piston 24"). Moreover, the elongated structure that is identified by numeral 24 is directly adjacent the piston ram drive 17 and along the axis of the treatment section. Such an elongated structure strongly suggests that it is a piston, particularly when viewed in context of the reference. If not a piston, what else does "a piston ram drive"

drive? More importantly, it teaches that it is well known to use a screw drive (Figure 1) or a piston ram drive (Figure 2) for moving a material through a microwave treatment section.

The argument regarding the unloading section and the unloading means is not persuasive. Firstly, the claim does not include any particular structure for the unloading section and means. Furthermore, it is respectfully submitted that any continuous heat-treatment device, which has a loading section for loading a material into the treatment zone, must also include an unloading section in order to retrieve the finished material. There is no exception in any of the references applied. Clearly, the section beyond the treatment section 1' in Chauffoureaux (including element 15 and 16) is the claimed unloading section as the material has left the treatment section and the outlet of die 16 is the claimed unloading means as the material is unloaded from the entire device. Unquestionably, this section meets the claimed intended function for "the material removed from said unloading section by unloading means".

Chauffoureaux uses "waveguide" to describe "the processing zone 1". Therefore, it is the same as the claimed 'treatment section" because any zone that carries microwave energy can be considered as a waveguide as is well known in the art of microwave heating devices. The treatment channel 14 of the claimed invention can also be considered as a waveguide itself. It is pointed out that the function of the claimed "plurality of microwave guides" is for "directing microwaves from a microwave generator into the material within the treatment section". Every microwave generating device requires a waveguide connecting the same to the treatment section as demonstrated in Chauffoureaux above. Again, it clearly shows in Figure 2, the routine use of a waveguide connecting the treatment section 1 and the magnetron 2 by a waveguide as shown symbolically above in order to guide the microwave from the magnetron 2 to the treatment

waveguide 1. Furthermore, the use of a plurality of waveguide for directing microwave into a microwave treatment section is well known as shown by Wear. Wear shows that it is well known in the art of conveyorized microwave dryers to use a plurality of microwave feed ports for directing microwave into the microwave treatment section to control the drying process. The feed ports routinely include a plurality of wave guides 116, 126, 132 connected to generators, 114, 124, 130 to radiating ports 118, 128, 134 for distributing microwave around the treatment section (see Figure 1 and col. 8, lines 26-54 and col. 9, line 39 – col. 10, line 34). Therefore, it shows each microwave treatment zones 14, 16, 18 includes a microwave generator 114 and a plurality of waveguides 116 to disperse the microwaves into the treatment zone to prevent microwave concentration for more uniform heating. Wear clearly teaches that the number of waveguides used can be selected to control the microwave field distribution and the amount of heating as it uses three waveguides 116 in zone 14, two waveguides 126 in zone 16 and only one waveguide 132 in zone 18. Therefore, using a plurality of waveguides in Chauffoureaux would have been readily suggested to an ordinary artisan in order to prevent wave concentration by dispersion of the microwave and to selectively adjust the amount of heating for better heating control as taught by Wear.

The argument that there is no reasonable expectation of success in combining references is not well taken. It is emphasized that Wear is only relied on for the teaching of the selective use of a plurality of waveguides. All that is needed to modify Chauffoureaux to arrive at the appellant's claimed invention is to use a plurality of waveguides instead of a single waveguide. It is submitted that the mere addition of a waveguide for connecting the microwave generator to the treatment zone would not affect or change the basic operation of the invention of

Chauffoureaux as it would only more uniformly distribute the microwave radiation within the treatment section.

In regard to claims 2 and 8, as admitted by the appellant, the use of a purge gas passing over a product is not an original idea, it is therefore respectfully submitted that the rejection of this claim should be sustained along with claim 1 for the reasons set forth above.

In regard to claims 3, 5, 6 and 9, the limitation "treatment section may be tilted" (emphasis added) is not a positive statement as there is no claimed structure for the intended function. Anyway, tilting the treatment section to increase or decrease the flow rate of material is clearly taught by Gerling. Although only the material transport tube 90 in Gerling is tilted, however, the transport tube may also be interpreted as the treatment section. Anyway, the use of a tilted material transport zone to control the flow rate is clearly taught by Gerling. To apply this well known feature in Chauffoureaux by tilting the treatment section 1' which is also the transport tube for the material would have been blatantly obvious to an ordinary artisan with the references before him/her. Again, it is emphasized that the claim only recites, "treatment section may be tilted" (emphasis added).

In regard to claims 4 and 9, the limitation "are modular such that the length of the dryer may be adjusted" is taught by Gerling. The Examiner respectfully notes that the column number of the quoted passage in Gerling was incorrect due to a typographical error; it should have read col. 9, lines 47-51 instead of col. 8, line 47-51. In that passage, Gerling states, "It is a further feature of the invention that microwave devices of the type described are adapted for modular construction which readily permits scale up or scale down to suit product requirements", Gerling therefore teaches the "modular" feature as claimed. In view of this teaching, it would have been

obvious to an ordinary skill in the art to further modify Chauffoureaux to form the device with modular sections to permit easy scale up or scale down depending on the product requirement for a more versatile system.

Conclusion

All the features in the claimed invention are shown or suggested in the cited references and the invention as a whole would have been obvious to an ordinary artisan with the references before him/her as set forth above.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Philip H. Leung
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4-14-2006

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